

WE CLAIM:

Sub 1. A processing agent adapted to transfer data of a predetermined data line length in an external transaction, the agent comprising an internal cache having a plurality of cache entries, each entry adapted to store multiple data line lengths of data. ✓

5 2. The processing agent of claim 1, wherein the cache entries include a tag portion adapted to store address information.

3. The processing agent of claim 2, wherein the internal cache further comprises match detection logic for the tag portions, and control logic provided in communication with the match detection logic.

10 4. The processing agent of claim 1, wherein the cache entries include a cache coherency state field in association with each data line length of data.

15 5. The agent of claim 1, further comprising a transaction queue having a plurality of queue entries, the queue entries including a primary entry adapted to store address information and status information of a first external transaction and a secondary entry adapted to store status information of a second external transaction.

6. The agent of claim 4, wherein the status information of the first external transaction includes a field representing whether the first external transaction is part of a multiple transaction sequence.

20 7. The agent of claim 4, wherein the total number of primary and secondary entries equals the multiple number of data line lengths provided in the cache entries.

Sub 3
8. A processing agent, comprising a transaction queue having a plurality of a queue entries, the queue entries further comprising:

a primary entry including an address portion and status portion, the status portion provided for a first external transaction of the agent, and

5 a secondary entry including a status portion provided for a second external transaction.

9. The transaction queue of claim 8, wherein the status portion of the primary entry includes a field representing whether the first transaction is part of a multiple transaction sequence.

10. The transaction queue of claim 8, further comprising control logic adapted to cycle through the queue entries and post transactions therefrom.

Sub 4
11. A processing agent, comprising:

an internal cache having cache entries each adapted to store multiple data lines, and a transaction queue system adapted to post external transactions, each external transaction related to a single data line,

15 wherein the internal cache and the transaction queue system each receive data requests on a common input.

12. The processing agent of claim 11, wherein the internal cache and the transaction queue system communicate by signal lines.

20 13. The processing agent of claim 12, wherein the signals lines include a cache hit signal line and a tag hit signal line.

14. The processing agent of claim 11, wherein the transaction queue system comprises a plurality of queue entries, each queue entry comprising:

a primary entry including an address portion and status portion, the status portion provided for a first external transaction of the agent, and

5 a secondary entry including a status portion provided for a second external transaction.

15. The transaction queue of claim 14, wherein the status portion of the primary entry includes a field representing whether the first transaction is part of a multiple transaction sequence.

10 16. The transaction queue of claim 14, further comprising control logic adapted to cycle through the queue entries and post transactions therefrom.

17. A method of processing a data request within a processing agent comprising:
posting the data request internally within the agent,
determining whether the request hit the cache,
15 when the request misses the cache, posting a sequence of external transactions to fill a cache line with data associated with the data request.

18. The method of claim 17, wherein the determining step includes:
comparing address information of the data request with tags stored in the internal cache, and

20 identifying a cache miss when the address information does not match any stored tag.

19. The method of claim 18, wherein the determining step further includes:
when address information matches a stored tag, reading cache coherency state information associated with the requested data, and

identifying a cache miss when the cache coherency state information is invalid for a request type of the data request.

20. The method of claim 17, further comprising, when the request hits the cache:
determining whether the request hits a tag stored in the cache, and

5 if so, generating a single external transaction to read the requested data into the agent..

21. The method of claim 20, wherein the second determining step includes:
comparing address information of the data request with tags stored in the internal
cache, and

10 identifying a tag hit when the address information matches a stored tag.

add
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